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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/164,714	10/01/98	TUCKER K	7116-074

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EXAMINER	
WILSON, M	

ART UNIT	PAPER NUMBER
1633	12

DATE MAILED: 03/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/164,714	TUCKER ET AL.	
	Examiner	Art Unit	
	Michael Wilson	1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2000* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9,11-13,16,20 and 71-78* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9,11-13,16,20 and 71-78* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *9* .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

DETAILED ACTION

Claims 1-8, 10, 14, 15, 17-19, 21-70 have been canceled. Claims 71-78 have been added. Claims 9, 11-13, 16, 20 and 71-78 are under consideration in the instant invention. Applicant's arguments filed 12-20-00, paper number 11, have been fully considered but they are not persuasive. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Objections

1. Claim 11 is objected to because of the following informalities:

M. catarrhalis should be spelled out, i.e. *Moraxella catarrhalis*.

"an apparent" in claims 9 and 11 should be changed to --a--.

Appropriate correction is required.

The "deduced" amino acid sequence of SEQ ID NO:1 or 7 (claim 9, b)) is the amino acid of SEQ ID NO:1 or 7. The term "deduced" should be deleted.

Specification

2. The amendment filed 12-20-00, paper number 11, is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the limitation of "98878" on page 66, line 10, is

new matter because applicants have not provided any evidence that the deposit was available at the time of filing or that the inventors deposited the product that is ATCC accession number 98878. Applicants state that the blank was a typographical error. Without any evidence that applicants had deposited ATCC accession number 98878 or that applicants were in possession of the deposit, ATCC accession number 98878, at the time of filing, the deposit number is considered new matter. Applicant is required to cancel the new matter in the reply to this Office action.

Claim Rejections - 35 USC § 112

3. Claims 9, 11, 13, 16, 20, 71-78 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims as newly amended are directed toward an isolated nucleic acid molecule encoding an OMP21 protein (claim 9) or "an OMP21 protein obtainable from a *M. catarrhalis* strain (claim 11). As such claims 9 and 11 are not limited to nucleic acids encoding an OMP21 protein obtained from *Moraxella catarrhalis*. The only OMP21 proteins taught in the instant specification are from *M. catarrhalis*; therefore, the nucleic acids must be isolated from the OMP21 of *M. catarrhalis*. Deletion of "an OMP21 protein," and insertion of the phrase --the OMP21 isolated from *M. catarrhalis*-- is suggested in claim 9. Deletion of the phrase "an

OMP21 protein obtainable from a *M. catarrhalis* strain," and insertion of the phrase --the OMP21 isolated from *M. catarrhalis*-- is suggested in claim 11.

New claim 78 recites the limitation of a fragment of OMP21 comprising at least 10 amino acids that have an antigenic epitope of SEQ ID NO:7. Applicants do not provide any antigenic epitopes of SEQ ID NO:7, nor were such fragments known in the art. The essential features for a fragment of OMP21 to be antigenic are not disclosed in the specification. Therefore, the specification does not provide adequate written description for any fragments of OMP21 comprising at least 10 amino acids that have an antigenic epitope of SEQ ID NO:7.

4. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitation of "98878" is new matter because applicants have not provided any evidence that the deposit was available at the time of filing or that the inventors deposited the product that is ATCC accession number 98878. Applicants state that the blank was a typographical error. Without any evidence that applicants had deposited ATCC accession number 98878 or that applicants were in possession of the deposit, ATCC accession number 98878, at the time of filing, the deposit number is considered new matter.

5. Claims 9, 11-13, 16 and 20 remain rejected and claims 71-78 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an isolated nucleic

acid molecule encoding an OMP21 isolated from *Moraxella catarrhalis* that has a molecular weight of about 16 kD to about 20 kD as determined by non-reducing SDS-PAGE using trypsin inhibitor and carbonic anhydrase as 21.5 kD and 31 kD molecular weight standards, respectively, comprising a nucleic acid sequence 1) encoding SEQ ID NO:1 or 7; 2) that is the complement of 1); 3) selected from the group consisting of SEQ ID NO:2-6 and 8-14; 4) which hybridizes at 68°C in 0.5M $NaHPO_4$ (pH7.2)/1 mM EDTA/7%SDS to any one of the sequences of 1), 2) or 3); 5) which is at least 70% identical to SEQ ID NO:6; and 6) which is at least 70% identical to the complement of SEQ ID NO:6 does not reasonably provide enablement for using any SDS-PAGE, an OMP21 with an "apparent" molecular weight as claimed, using SEQ ID NO:15-20 to identify naturally occurring OMP21 isolated from *M. catarrhalis*, using the BLASTN algorithm, ATCC #98878, transforming host cells *in vivo,* determining polypeptides that elicit an immune response that is of an enabled use against *M. catarrhalis*, linking the nucleic acid sequence to a heterologous sequence that is a pre-/pro- sequence that facilitates transport, translocation or processing, affinity purification sequences, or immunogenic epitopes of a pathogen, or a fragment of OMP21 comprising at least 10 amino acids and having an "antigenic epitope of SEQ ID NO:7". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

For clarification, SEQ ID NO:2-5 are degenerate PCR primers used to isolate the OMP21 gene (page 57, line 7), SEQ ID NO:6 is the entire OMP21 gene (page 60, line 9), SEQ ID NO:8-

11 are primers for suppression PCR (page 58, line 14) and SEQ ID NO:12-14 are sequencing primers (page 60, line 1). Mutations in the OMP21 gene were made using primers SEQ ID NO:15 and 16 (page 60, line 25). SEQ ID NO:17-20 are PCR primers of the OMP21 gene and introduce a restriction site (page 61, line 35). SEQ ID NO:7 is the deduced amino acid sequence of OMP21 (page 60, line 11). SEQ ID NO:1 is a fragment of the OMP21 amino acid sequence (page 25, line 23). The function of the OMP21 protein is not known or disclosed. In general, the nucleic acids disclosed have utility in detecting the presence of the pathogen *M. catarrhalis*.

The claims as newly amended are directed toward an isolated nucleic acid molecule encoding an OMP21 protein with a molecular weight of about 16 kD to about 20 kD as determined by SDS-PAGE using trypsin inhibitor and carbonic anhydrase as 21.5 kD and 31 kD molecular weight standards, respectively (claim 9) or "obtainable from a *M. catarrhalis* strain (claim 11). As such claims 9 and 11 are not limited to nucleic acids encoding an OMP21 protein obtained from *Moraxella catarrhalis*. The only enabled use for the instant invention is to detect *M. catarrhalis*; therefore, the nucleic acids must be isolated from *M. catarrhalis*. Deletion of "an OMP21 protein," and insertion of the phrase --the OMP21 isolated from *M. catarrhalis*-- is suggested in claim 9. Deletion of the phrase "an OMP21 protein obtainable from a *M. catarrhalis* strain," and insertion of the phrase --the OMP21 isolated from *M. catarrhalis*-- is suggested in claim 11.

The specification does not enable using nucleic acids comprising non-natural sequences such as those that introduce mutations or restriction sites (SEQ ID NO:15-20). SEQ ID NO:15-

20 do not encode the OMP21 of *M. catarrhalis* as claimed because they contain sequences that are not found in the OMP21 gene of *M. catarrhalis*. SEQ ID NO:15-20 do not have an enabled use because they cannot be used to detect the naturally occurring OMP21 of *M. catarrhalis*. Therefore, claim 11 should be limited to SEQ ID NO:2-6 and 8-14. In addition, claims 9 and 11 should clearly recite that the OMP21 protein is isolated from *Moraxella catarrhalis*.

The specification does not enable an OMP21 protein with an "apparent" molecular weight of about 16 kD to about 20 kD as determined by either reducing or non-reducing SDS-PAGE using trypsin inhibitor and carbonic anhydrase as 21.5 kD and 31 kD molecular weight standards, respectively. The claim must positively recite that the molecular weight is about 16 kD to about 20 kD to be a naturally occurring OMP21 from *Moraxella catarrhalis*. The word "apparent" introduces ambiguity as to wether the molecular weight is ever determined which would encompass proteins that are not OMP21, not naturally occurring or not from *Moraxella catarrhalis*.

The specification does not enable using any method of SDS-PAGE to determine the molecular weight that provides adequate information. The only SDS-PAGE used to detect naturally occurring OMP21 of *Moraxella catarrhalis* is a non-reducing SDS-PAGE gel. A reducing gel would not give adequate results to detect naturally occurring OMP21 of *Moraxella catarrhalis*.

The term "apparent" should be deleted and "non-reducing" should be added before "SDS-PAGE" in claims 9 and 11.

The specification does not enable one of skill to obtain the plasmid pOMP21X from *E. coli* as deposited with the ATCC and assigned accession number 98878.

If the deposit was made under the provisions of the Budapest Treaty, filing of an affidavit or declaration by applicants, assignees or a statement by an attorney of record over his or her signature and registration number stating that the deposit has been accepted by an International Depository Authority under the provisions of the Budapest Treaty, that all restrictions upon public access to the deposit will be irrevocably removed upon the grant of a patent on this application and that the deposit will be replaced if viable samples cannot be dispensed by the depository is required. This requirement is necessary when a deposit is made under the provisions of the Budapest Treaty as the Treaty leaves this specific matter to the discretion of each State. Amendment of the specification to recite the date of the deposit and the complete name and address of the depository is required. Furthermore, unless deposit was made at or before the time of filing, a declaration filed under 37 C.F.R. 1.132 is necessary to construct a chain of custody. The declaration, executed by a person in a position to know, should identify the deposited material by its depository accession number, establish that the deposited material is the same as that described in the specification, and establish that the deposited material was in applicant's possession at the time of filing. In re Lundak, 27 USPQ 90.

If the deposit has not been made under the Budapest Treaty, then in order to certify that the deposit meets the criteria set forth in 37 CFR 1.801-1.809, applicants may provide assurance of compliance by an affidavit or declaration, or by a statement by an attorney of record over his or her signature and registration number, showing that,

(a) during the pendency of this application, access to the invention will be afforded to the Commissioner upon request;

(b) all restrictions upon availability to the public will be irrevocably removed upon granting of the patent;

(c) the deposit will be maintained in a public depository for a period of 30 years of 5 years after the last request or for the enforceable life of the patent, whichever is longer;

(d) a test of the viability of the biological material at the time of the deposit was made and that the test results indicated that said biological material was viable (see 37 CFR 1.807); and,

(e) the deposit will be replaced should it become necessary due to inviability, contamination or loss of capability to function in the manner described in the specification.

As required under 37 C.F.R. § 1.809(d), the specification shall contain: (1) the accession number for the deposit; (2) the date of deposit; (3) a description of the deposited biological material sufficient to identify it and to permit its examination; and (4) the name and address of the depository.

The specification does not enable one of skill to determine the BLASTN algorithm (claim 9, d)). The algorithm used by BLASTN is not always the same. The BLASTN algorithm is not defined in the specification. Given the variability in the algorithms used to determine percent identity and the lack of definition in the specification, it would have required one of skill undue experimentation to determine the algorithm that applicants consider the BLASTN algorithm.

The specification does not enable one of skill to determine how to use the nucleic acid fused to a heterologous sequence at the 5' terminus or 3' terminus of said molecule, vectors comprising such nucleic acids or host cells comprising such vectors (claims 71-73, 75 and 76). The specification does not provide adequate guidance how to use the nucleic acid claimed fused to pre-/pro-sequences that facilitate transport, translocation or processing of OMP21, affinity purification sequences, sequences that comprise an immunogenic epitope of a surface exposed protein of a microbial pathogen or fragments comprising at least 10 amino acids and having an antigenic epitope of SEQ ID NO:7 (claims 74 and 78). The specification does not teach the pre-/pro-sequences that facilitate transport, translocation or processing of OMP21, affinity purification sequences, immunogenic epitopes of a microbial pathogen or fragments comprising at least 10 amino acids and having an antigenic epitope of SEQ ID NO:7. Without such guidance it would require one of skill undue experimentation to determine how to adapt the vector, determine

elements required to facilitate transport, translocation or processing of OMP21, purify the protein induce an antigenic immune response or any other immune response using the claimed invention.

The specification does not enable transforming host cells *in vivo* which is encompassed by claims 16, 76 and 77 for reasons of record. The state of the art at the time of filing was such that the vector, promoter, and route of delivery required to transform cells *in vivo* was not within the realm of routine experimentation for one of skill (Verma et al. Sept. 18, 1997, Nature, Vol. 389, pages 239-242; see page 239, 3rd column, line 10). The vector, promoter and elements of a construct, mode and route of delivery and level of expression required to obtain a desired effect using gene delivery *in vivo* were not within the realm of routine experimentation to one of skill at the time of filing. While the specification contemplates transfecting cells *in vivo*, the specification does not teach the vector, promoter, elements of a construct, mode and route of delivery or level of expression required to obtain a therapeutic or prophylactic effect. The citations in Exhibit B do not overcome the unpredictability in the art because they do not correlate to delivering OMP21 proteins *in vivo* and do not teach the vector, promoter, elements of a construct, mode and route of delivery or level of expression required to obtain a therapeutic or prophylactic effect against *M. catarrhalis*. Therefore, claims 16, 76 and 77 should be limited to an "isolated" transformed cell.

6. Claims 9, 11, 13, 16, 20, 71-77 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "apparent molecular weight of about 16 kD to about 20 kD" is indefinite because the metes and bounds of what applicants consider "apparent" molecular weight in relation to "about" 16-20 kD as claimed. The term apparent is subjective and has various meanings in the art and the term is not defined in the specification as it relates to a molecular weight of about 16-20 kD. Therefore, the metes and bounds of the weights encompassed by the claim cannot be determined.

The phrase "an OMP21 protein obtainable from a *M. catarrhalis* strain" is indefinite because it is unclear if the OMP21 protein is obtained from *M. catarrhalis* strain or from other sources. The metes and bounds of the proteins encompassed by the claims cannot be determined.

Claims 9, 11, 13, 16, 20 and 71-77 appear to be free of the prior art of record because the prior art of record did not teach or suggest an isolated nucleic acid molecule encoding the OMP21 protein of *Moraxella catarrhalis* that has a molecular weight of about 16-20 kD as determined by SDS-PAGE using trypsin inhibitor and carbonic anhydrase as 21.5 kD and 31 kD molecular weight standards, respectively, as claimed.

Claim 12 appears to be free of the prior art of record because ATCC #98778 appears to have been deposited to the ATCC in September of 1998, but was not available to the public. This was confirmed by ATCC on March 2, 2001 by Examiner Wilson.

Claim 78 appears to be free of the prior art of record because the prior art of record did not teach or suggest a nucleic acid encoding a fragment of an OMP21 comprising at least 10 amino acids and having an antigenic epitope of SEQ ID NO:7.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

No claim is allowed.

Inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Wilson who can normally be reached on Monday through Friday from 9:00 am to 5:30 pm at (703) 305-0120.

Questions of formal matters can be directed to the patent analyst, Tracey Johnson, who can normally be reached on Monday through Friday from 9:00 am to 5:30 pm at (703) 305-2982.

Questions of a general nature relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-0196.

If attempts to reach the examiner, patent analyst or Group receptionist are unsuccessful, the examiner's supervisor, Deborah Clark, can be reached on (703) 305-4051.

The official fax number for this Group is (703) 308-4242.

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